

Sept. 15 **Chemical Tests**

Used to identify unknown substances.

Examples:

1. Oxygen gas is indicated if glowing splint bursts into flame
2. Carbon Dioxide is present if limewater solution turns milky. (white precipitate) *solid precipitate.*

Chemical Reaction.

Reactant A + B \rightarrow Product

Oxygen + Iron \rightarrow Rust

Chemical Tests

Examples:

3. Hydrogen gas is present if flaming split makes a "pop." sound.
4. Water vapor is present if cobalt chloride paper changes from blue to pink

litmus test

more examples...

- Pregnancy Test
- Breathalyzer
- Blood Sugar with diabetes
- Recreational Drug testing at music festivals.

The Atom

e^-

Protons (+)

Neutrons.

the fingerprint for each element.

Test?

Atoms are made out of three basic particles:

- Protons** - carry a positive charge
- Neutrons** - carry no charge

Protons and Neutrons join together to form the Nucleus the central part of the atom

- Electrons** - carry a negative charge and circle the nucleus

Click on a particle to learn more about it

Fun Facts

taken from: <http://education.jlab.org/atomtour/1stofparticles.html>

what happens with (+) (-)

Electrons

- Negatively charged (-)
- Almost have no mass ($1/1836^{\text{th}}$ mass of protons & neutrons)
- Located around the outside of the nucleus

Proton

- Same mass as neutrons
- Positively charged (+)
- Located in center of atom (nucleus)
- Number of protons in an atom is equal to the elements atomic number.

Protons + Neutrons = Atomic Mass.

Atomic #

Carbon

of Protons (6) *# of electrons* (6)

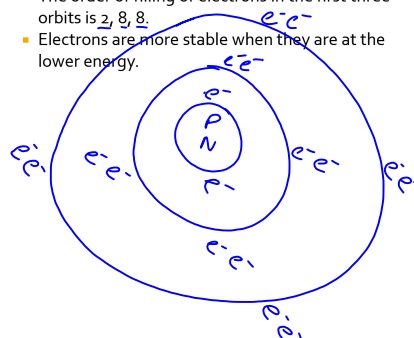
Atomic mass. (12) *- Atomic # = # of Neutrons* (12 - 6 = 6)

Neutron

- Same mass as proton
- No charge
- Located in nucleus
- Number per atom may vary – but is similar to number of protons

Bohr's Planetary Model of the Atom

- Bohr suggested that:
- Electrons move around the nucleus in circular paths called orbits, like planets around the sun.
- Each electron has a definite amount of energy.
- The order of filling of electrons in the first three orbits is 2, 8, 8.
- Electrons are more stable when they are at the lower energy.



Bohr Diagrams for:

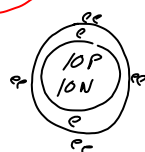
Oxygen

8O^{16}
 2^{-}



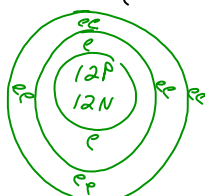
Neon

10Ne^{20}



Magnesium

12Mg^{24}
 2^{+}

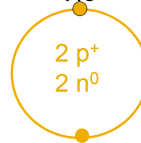


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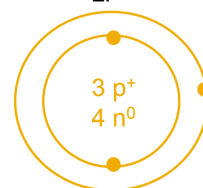
Bohr - Rutherford Diagrams

- Find the # of protons, neutrons, and electrons
- Draw protons (p^{+}), (n^{0}) in circle (i.e. "nucleus")
- Draw electrons around in shells - 2,8,8 are the numbers of electrons allowed in the rings for the first 20 elements

He



Li

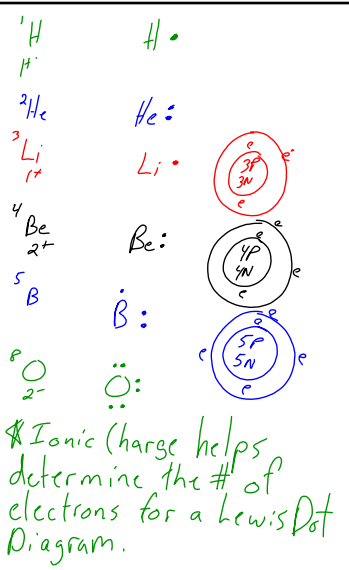


Lewis Dot Diagrams

- Used to easily show the outer level electrons (valence electrons) of atoms.

Step 1: Determine the valence electrons

Group 1 - 1	15 - 5
2 - 2	16 - 6
13 - 3	17 - 7
14 - 4	18 - 8



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- Step 2: Write the element symbol and a dot for each valence electron.

*** each side can hold 2 valence electrons.
They go in one at a time before pairing up.



- Example:

Nitrogen - group 15 - 5 valence electrons